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[54] **COMPOSITE POLYMERIC MATERIAL FOR BIOLOGICAL AND MEDICAL APPLICATIONS AND THE METHOD FOR ITS PREPARATION**

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[58] **Field of Search** ..... 523/105, 106, 113, 114; 524/21, 24, 498, 460, 845; 525/54.1, 937; 351/160 H; 260/123.7

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[57] **ABSTRACT**

The invention relates to a composite polymeric material suitable for biological and medical applications and to the method for preparation thereof. The composite material consists of 1–99 wt. % of hydrophilic polymer or copolymer based on methacrylic or acrylic esters, 1–99 wt. % of fibrillar collagen, and up to 2.5 wt. % of a crosslinking agent, based on both polymeric components. The composite material may further comprise biologically active compounds and other auxiliary materials, as fillers and/or plasticizers. The composite material is prepared by dispersing the fibrillar collagen in a solution or a highly swollen dispersion of the synthetic hydrophilic polymer or copolymer in a lyotropic agent and the subsequent removal of the lyotropic agent, thus forming a matrix of the synthetic polymer or copolymer penetrated by fibrillar collagen or vice versa. The composite material may be applied on a solid support or reinforced with glass, plastics, cellulose, or metallic materials.

A method for the preparation of the composite material consists in dispersing of fibrillar collagen in a solution or a highly swollen dispersion of the synthetic hydrophilic polymer or copolymer in a lyotropic agent, e.g. in water diluted carboxylic acids, strongly acidified aqueous mixtures of ethanol and methanol, high-concentrated aqueous solutions of lyotropic salts, and high-concentrated aqueous solutions of urea or guanidinium chloride, at temperature not exceeding 37° C., and the subsequent removing of the lyotropic agent from the viscous dispersion at temperature not exceeding 37° C. using the known methods.

The crosslinking agent, e.g. trimethylolurea, formaldehyde, acetaldehyde, glutaraldehyde, starch dialdehyde, glyoxal, or Cr(III) salts, may be added in the course of preparation of the dispersion or after removal of the lyotropic agent.

3 Claims, No Drawings